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BS MLT 4TH SEMESTER

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QUESTION ,1:   Discuss a few limitation of image scanners ? How optical character recognition (OCR) device overcome these limitations ?

Answer :

Limitation of image scanners :

- **Images produced by the scanner can take up a lot of memory space.**

- **Images lose some quality in the scanning and digitising process.**

- **The quality of the final image is dependent on the quality of the original image .**

- **Emotional value - is there value in the original image.**

  More expensive than others

How optical charter recognition software work:

- **Scanner equipped with a character recognition software (called OCR software) that converts the bit map images of characters to equivalent ASCII codes**

- **Enables word processing of input text and also requires less storage for storing the document as text rather than an image**

- **OCR software is extremely complex because it is difficult to make a computer recognize an unlimited number of typefaces and fonts**

Two standard OCR fonts are OCR-A (American standard) and OCR-B (European standard)

part : b   Elaborate the uses of magnetic Ink character recognition device (MICR) ?

Answer :

MICR (magnetic ink character recognition) is a technology used to verify the legitimacy or originality of paper documents, especially checks. Special ink, which is

sensitive to magnetic fields, is used in the printing of certain characters on the original documents. Information can be encoded in the magnetic characters.

Uses of magnetic Ink character recognition device :

MICR (magnetic ink character recognition) is a technology used to verify the legitimacy or originality of paper documents, especially checks. Special ink, which is sensitive to magnetic fields, is used in the printing of certain characters on the original documents. Information can be encoded in the magnetic characters.

The use of MICR can enhance security and minimize the losses caused by some types of crime. If a document has been forged - for example, a counterfeit check produced using a color photocopying machine, the magnetic-ink line will either not respond to magnetic fields, or will produce an incorrect code when scanned using a device designed to recover the information in the magnetic characters. Even a legitimate check can be rejected if the MICR reader indicates that the owner of the account has a history of writing bad checks.

Retailers commonly use MICR readers to minimize their exposure to check fraud. Corporations and government agencies also use the technology to speed up the sorting of documents.

QUESTION 2:   Difference between printer and plotter ?

Answer :

PRINTER :

A printer is an output device that produces graphics and texts on a physical medium such as paper. A printer draws images and texts on a page with the help of commands given through a computer. Printers are often connected to computers either wirelessly or through the use of USB cable. More importantly, one printer can be connected to many computers allowing all computers to be able to print on that printer. Today, wireless printing technology makes the task of printing from smart phone, notebook computer or digital camera even easier. Software for printers includes Photoshop and any other image-editing program.

The new generation of printers comes with features such as scanner, copier and fax. They are also able to support memory cards, digital cameras or scanners; and the speed which they work is faster than other devices. Printers can read BMP, PDF and JPG TIFF formats.

Bluetooth and infrared technologies are the two common wireless technologies used in printing. In infrared printing, a printer communicates with a computer or other device using infrared light waves whereas in Bluetooth printing, computer or other device transmits output to a printer through radio waves in Bluetooth.

There are two types of printers, impact and non-impact printers. Impact printers are printers that work by banging a head or needle against an ink ribbon to make a mark on the paper whereas non-impact printers do not operate by striking a head against a ribbon. Printers can further be classified depending on the type of technology used in printing. They include:

> Toner-based printers, they use dry toner as ink, which is fused on paper by hot rollers.

> A dye-sublimation printer which uses heat to transfer dye to a medium such as a plastic card, paper or canvas.

> Inkless printer, which works by heating regions of a heat-sensitive paper that create images or text on it.

> Liquid ink printer which uses liquid ink that is heated into a vapor bubble and then sprayed onto the paper.

> Solid ink printers, which use thermal transfer technology and solid sticks of color that are wax-like in texture; this ink is melted and sprayed on a rotating oil-coated drum, which passes the image onto the paper .

Plotter :

 A plotter is a special output device used to produce hard copies of large graphs and designs on paper, such as construction maps, engineering drawings, architectural plans and business charts. The plotter is either a peripheral component that you add to your computer system or a standalone device with its own internal processor. Plotters can read files in the DWG, CDR, AI and other vector formats.

Plotters generally produce continuous lines and in this regard they are made up of an automated pen like instrument and a movable head. Now, as the paper is fed into the plotter the head moves forward and backwards, creating lines that eventually result in designs such as diagrams or blueprints. A plotter also has the capacity of drawing several hundred copies of the same drawing over and over without requiring new commands.

Plotters are most used in drawing designs where proper measurement and precision in diagrams is required. In this regard, they are commonly used in architectural and engineering fields. In engineering they are used to draw designs of automobiles such as car engines, crank shaft etc, whereas in architecture they are often used to produce building plans and designs. Plotter software includes Adobe Illustrator, Corel, Flexi and CAD.

Plotters come in various forms, the latest form of a plotter is the 3D plotter which does not use a pen like instrument but has several knives arranged together and cut out the piece of material based on the instruction given from a computer. Other common types of plotters include:

> Drum Plotter. This pen plotter which wraps the paper around a drum with a pin feed attachment.

> Flatbed Plotter. This is a mechanical drafting device used with many CAD programs for designers.

> Inkjet Plotter. This type of plotter creates an image by spraying small droplets of ink on to paper.

> Cutting Plotter. This a large scale cutting device that produces ready-cut 88mylar or and graphics .

Part b : Explain the printing process of laser printer ?

Answer : printing process of laser printer :

The laser printing process can be broken down into seven major steps:

Step 1: Sending

To begin the laser printing process, the document is sent from the respective computer to the laser printer and the sent document is processed by the laser printer.

Step 2: Cleaning

Cleaning is a physical and electrical process carried out in order to remove the previous print job and prepare the photosensitive drum for the new print job. Remnants of toner on the drum are scraped away by a rubber-cleaning blade into a debris cavity. Remnants of electrical charges on the drum from the previous print job are defused by electrostatic erase lamps. Lubrication is then applied to the heat roller in order to make sure an adequate amount of heat is evenly applied to transfer the incoming image.

Step 3: Conditioning

Conditioning involves applying a negative charge to the drum unit and the paper as it passes through the corona wire or transfer roller. The application of a negative charge to the paper allows an image to be electrostatically transferred to the page.

Step 4: Exposing

Laser time! The next step is exposing. In this step, the photosensitive drum is exposed to a laser beam, (possibly a laser beam refracted from a spinning mirror inside the printer). Every area of the drum exposed to the laser beam has its surface charge reduced to about 100 volts DC. An invisible latent image is generated as the drum turns.

Step 5: Developing

In the developing step, toner is applied to the latent image on the drum. The toner is comprised of negatively-charged powdered plastics — black, cyan, magenta, and yellow. The drum is held at a microscopic distance from the toner by a control blade.

Step 6: Transferring

The next step is transferring. The secondary corona, or transfer, applies a positive charge to the paper. The negatively-charged toner on the drum is

magnetically attracted to the now positively-charged paper. The image is transferred to the paper and maintains its position due to its positive charge.

Step 7: Fusing

The final step is fusing. Heat and pressure are applied to the toner by the fusing rollers. The toner generates a permanent bond as it is pressed and melted into the paper. Teflon covers the fusing rollers as a light silicon oil is applied in order to remove any possibility of the paper sticking to them

QUESTION : 3 : Explain Metropolitan area network (MAN) with suitable example ?

Answer :

metropolitan area network (MAN)

A metropolitan area network (MAN) is a network that interconnects users with computer resources in a geographic area or region larger than that covered by even a large local area network (LAN) but smaller than the area covered by a wide area network (WAN).

A metropolitan area network (MAN) is a network that interconnects users with computer resources in a geographic area or region larger than that covered by even a large local area network (lan) but smaller than the area covered by a wide area network)The term is applied to the interconnection of networks in a city into a single larger network (which may then also offer efficient connection to a wide area network). It is also used to mean the interconnection of several local area networks by bridging them with backbone lines. The latter usage is also sometimes referred to as a campus network.

Example of metropolitan area networks of various sizes can be found in the metropolitan areas of London, England; Lodz, Poland; and Geneva, Switzerland. Large universities also sometimes use the term to describe their networks. A recent trend is the installation of wireless MANs.

Part : b : Define topology ? which topology would you choose to setup a local area network and why ?

Topology :

Network topology is the interconnected pattern of network elements. A network topology may be physical, mapping hardware configuration, or logical, mapping the path that the data must take in order to travel around the network.

There are many identified topologies but they are not strict, which means that any of them can be combined. However, each topology has a different standard and may use different hardware methods so they are not interchangeable.

Star topology is best for local area network :

Star topology has become the dominant physical topology for LANs. The **star** was first popularized by ARCNET, and later adopted by Ethernet. Each node is connected directly to a central device such as a hub or a switch, as

QUESTION 4:   in your opinion, what are the different types of common media used for storage access and transmission ? explain each types in details.

Answer :

Transmission media and types :

In network communications, a **transmission medium** is a physical connection or an interface between the transmitter and the receiver. There are two major categories of transmission media, namely guided and wireless (or unguided). Let us take a walk through the types of transmission media and connectors in detail in this lesson.

Let's first take a closer look at the different types of guided transmission media one at a time.

1. Twisted pair cable

Twisted pair cables have been around for a long time. They were mainly invented for voice transmissions. Twisted pair is a widely used medium in networking because it's lighter, cheaper, more flexible, easy to install, and provides greater speeds than coaxial cables. There are two types of twisted pair cables: the unshielded twisted pair (UTP) and the shielded twisted pair (STP). Let's take a closer look at each of them.

The unshielded twisted pair cable has 4 pairs of copper wires that are present inside a plastic sheath. These wires are twisted to protect them from interference. The only protection available for a UTP cable is a plastic sheath that is thin in size

The shielded twisted pair cable is widely used in high-speed networks. The major difference between UTP and shielded twisted pair is that STP makes use of a metallic shield to wrap the wires. This metallic shield prevents interference to a better extent than UTP. These STP cables come with numbering; the higher the numbering, the better the interference prevention. As an example: most computer networks must go with CAT 3 or CAT 5, and nothing less than this.

2.Coaxial Cables

The coaxial cables have a central copper conductor, surrounded by an insulating layer, a conducting shield, and the outermost plastic sheath. Thus, there are three insulation layers for the inner copper cable. There are two basic modes of data transmission in coaxial cables: baseband mode that has dedicated bandwidth, and broadband mode that has distributed cable bandwidth.

Cable TV and analog televisions mainly use coaxial cables. Coaxial cables have better resistance to cross talk than twisted pair cables. The coaxial cables are used for long distance communication. The most widely used types of coaxial cables are RG-59 and RG-6 (RG stands for 'radio guide'). RG-59 has lesser shielding and is suitable for short cable lengths and cable TV connections.

RG-6 has better insulation than RG-59 and is used for satellite TV and digital signal transmissions for better strength and longer distances.

There are many advantages to coaxial cables, including the following:

- ➢ High bandwidth
- ➢ Easy and cheap installation
- ➢ Better immunity from noise
- ➢ Better scaling

However, there are also a number of disadvantages to coaxial cables, which include the following:

- They're more prone to lightning strikes.
- They cover less distance than fiber optic cables.
- They carry less bandwidth than both fiber optic and twisted pair cables.

Now let's move onto a different type of guided transmission media.

3.optical fibers

Optical fibers use light waves for transmission. Crosstalk, EMI, and attenuation aren't issues with optical fibers. These cables are well-suited for voice, data, and video transmissions. Optical fibers are the most secure of all the cable media. Installation and maintenance are difficult and costly. Fiber optic cables have greater transmission speed, high bandwidth, and

the signal can travel longer distances when compared to coaxial and twisted pair cables. Though the cost of optical fiber cable is less compared to co-axial and twisted pair cables, the additional optical components needed for installation make fiber optic the costliest of all the cables.

The advantages of optical fibers include the following:

- ➢ There is zero interference and covers major cities and countries.
- ➢ They have high speed and high bandwidth.
- ➢ They're highly secure.

There also are number of disadvantages, including the following

- Installation and maintenance are difficult.
- Cabling is costly.
- Retrofitting an existing network is difficult, since optical fibers are incompatible with many types of electronic networking equipment.

There are two modes of operation for optical fibers. First there's single-mode fiber, which uses a single beam of light and allows communication over great distances with better transfer speed. Then there is multimode fiber, which uses multiple light beams inside a single fiber cable, has a reduced length and travel speed, and has a larger bandwidth, but signal strength is weakened

Now let's take a closer look at unguided transmission media, or as it's most commonly known, wireless.

4. wireless or Unguided transmission media:

The features of wireless/unguided transmission media are that the signal gets broadcast without any guided medium through the air and is less secure. There are three types of wireless transmission media:

- ➢ Radio wave
- ➢ Infrared
- ➢ Microwave

The advantages of unguided transmission media include the following:

- They are useful in wireless remote accessing methods.
- Networks can be expanded without disturbing the current users.

The disadvantages include:

2. Potential security issues.
3. They have limited speed compared to guided transmission media.